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The social learning potential of participatory water valuation workshops: A case study in Tasmania, Australia

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Abstract

Participatory water valuation workshops are useful for their valuation outcomes, but can they also foster social learning? Social learning involves changes in understanding through social interactions between actors, which go beyond the individual to become situated within wider social units. Participatory water valuation workshops involve dialoguing about knowledge, perspectives, and preferences, which may be conducive to social learning. In this paper, we assess the social learning potential of a participatory valuation workshop, based on a case study in Tasmania, where farmers, water managers, and a policy maker shared their personal perspectives on the past, current and future values of irrigation water. To assess the social learning potential of a single participatory valuation workshop, we analyzed drivers—that is, factors positively influencing social learning—and outcomes—that is, indications that social learning occurred. Data were collected through an exit survey, in-workshop reflections and semistructured interviews following 3 weeks and 6 months after the actual workshop. The results indicate that the workshop provided the drivers for social learning to occur. In addition, participants indicated to have learned from and with others, and that the workshop provided improved and extended networks. According to the participants, the workshop led to a shared concern about increasing prices for water licences and induced substantive outcomes related to the use, management, and governance of irrigation water. We conclude that participatory valuation workshops, such as the one analyzed here, can foster social learning.

KEYWORDS

irrigation, participatory water valuation, social learning, Tasmania

1 | INTRODUCTION

Water management and governance has traditionally been characterized by top down command-and-control decision-making with limited attention afforded to approaches based on learning or adaptive management (Gleick, 2003; Pahl-Wostl et al., 2007; Pahl-

Wostl, Mostert, & Tàbara, 2008). However, there is growing recognition that end-users, water managers, and policy makers can benefit from learning with each other to attain their goals (Garrick et al., 2017; Pahl-Wostl, 2017; Rodela, 2012; Savenije, Hoekstra, & van der Zaag, 2014). A learning approach means that authorities and other stakeholders use dialogue to share perspectives,

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knowledge, and (reasons for) preferences, laying the foundations for negotiations and collaboration between stakeholders (Working Group 2.9, 2003). One form of learning that is commonly associated with adaptive water management is “social learning” or learning that is based on dialogue and operates through social interactions (Muro & Jeffrey, 2008).

Social learning is often recommended to deal with uncertainty, ambiguity and change in values, all typical characteristics of complex environmental problems (Pahl-Wostl et al., 2007). The literature on social learning in water management contains many case studies of learning processes designed to foster collective action among stakeholders, by “learning together to better manage together” (Ridder et al., 2005; Rodela, 2013). However, in the literature several issues are the subject of persistent debate (Gerlak, Heikkilä, Smolinski, Huitema, & Armitage, 2018; Muro & Jeffrey, 2008). In this paper, we focus on three interrelated issues. First, social learning processes often aim to support decision-making by enabling participants to develop a shared understanding and identify common interests that can be pursued through collective action. However, neither shared understanding nor convergent interests are guaranteed outcomes of social learning; on the contrary, they are rarely attributable to social learning processes alone (Johannessen et al., 2019). Second, benefits to accrue from social learning processes are highly contingent on inclusive participatory processes, but existing power asymmetries between participants can undermine both the process as well as its outcomes (Flood & Romm, 1996; McCrum et al., 2009). Third, most scholars acknowledge that it takes a long time and sustained effort for the benefits of social learning to be realized (Raadgever, Mostert, & van de Giesen, 2012). In the absence of longitudinal studies, evaluation of social learning has mostly been limited to assessing personal perspectives and relational outcomes, see for example, (Sol, Beers, & Wals, 2013; van der Wal et al., 2014) with few studies able to attribute more substantive outcomes or collective action to social learning as it is difficult to detect whether and how learning catalyzes action (Suškevičs, Hahn, Rodela, Macura, & Pahl-Wostl, 2018). A better understanding of ways to foster and assess social learning processes is necessary to increase acknowledgment, adoption, and funding of social learning processes.

In response to the above-mentioned debates, the proposition that we examine in this paper is that a single, well-designed water valuation workshop can foster social learning. We examine this proposition through a case study of a participatory water valuation workshop held in Tasmania, Australia. The workshop involved a small group of four farmers, two consultants, one irrigation scheme manager, and one policy maker. The first and second authors of this paper facilitated and evaluated the workshop. The aim of the workshop was to elicit personal preferences and underlying reasons for (not) investing in irrigation water in order to learn from each other's insights, and reasoning. Crossover points or points of indifference in preferences were used as a tool to facilitate a structured deliberative dialogue, as will be discussed in detail later. The intent was not to arrive at an agreed monetary value for water or to support group decision-making, but rather to create a learning experience that would serve as a foundation for

ongoing social learning. To assess the social learning potential, we focus our analysis on drivers and outcomes of social learning in a participatory workshop setting. Drivers refer to factors that positively influence social learning and outcomes are indicators that social learning occurred. Taken together they provide evidence of the extent to which the participatory workshop led to social learning. While we acknowledge that the benefits of social learning are challenging to evaluate in the short term, we demonstrate that it is possible to assess the outcomes of a single workshop at multiple points in time.

This paper presents our analysis in four sections. We first briefly review the three focal debates on social learning (Section 1.1). We then argue that deliberative dialogue is a crucial driver for social learning (Section 1.2), and introduce the literature we build on to assess social learning (Section 1.3). In Section 2, we present a framework for assessing whether and to what extent social learning has occurred, introduce the case study, share workshop design decisions, and outline our methods. We then present our results (Section 3) and discuss our contributions to the literature, limitations of this work, and further research (Section 4), before concluding with implications for practice.

1.1 | Debates on social learning

Social learning is a broadly used term, which has shifted from being about individuals learning by observing and imitating within a social environment (Bandura, 1977) to the development of shared meanings and practices, founded in participatory processes (Pahl-Wostl et al., 2007; Wehn, Collins, Anema, Basco-Carrera, & Lerebours, 2018). Limited agreement on the definition of social learning—for extended reflections on streams within social learning literature see for example, Gerlak et al. (2018); Rodela (2013) or Suškevičs et al. (2018)—has constrained its development and evaluation (Reed et al., 2010; van der Wal et al., 2014). In part, the profusion of perspectives is reflected in the diverse goals ascribed to social learning (Siebenhüner, Rodela, & Ecker, 2016). Some see it as a pathway to developing adaptive capacity (e.g., Lumosi, Pahl-Wostl, & Scholz, 2019; Tompkins & Adger, 2004), others as a foundation of deliberative democracy (Barraclough, 2013; Dryzek, 2006). It is also seen as a means of developing convergence in mental models, common understanding, and consensus (Scholz, Dewulf, & Pahl-Wostl, 2014; van der Wal et al., 2014), or as a strategy to improve cooperation and conflict resolution among stakeholders (Pahl-Wostl et al., 2008), for instance, to address wicked problems (Huitema, Cornelisse, & Ottow, 2010). In this paper, we use the definition proposed by Reed et al. (2010), who suggest that social learning processes must meet three key requirements: (a) there must be a change in understanding; (b) this change must be a result of social interaction; and (c) learning takes place beyond the direct members participating in the learning process.

Social learning is entwined with participatory processes that seek to address complex issues of environmental governance (Rodela & Gerger Swartling, 2019). Muro and Jeffrey (2008) trace major claims in the literature on social learning to the underlying premise that participation generates a common understanding among participants.

Such a shared understanding may relate to system functions or properties, but could also be a shared understanding of the problem to be managed. For instance, participants may review their narrow framing of a problem by actively engaging with multiple other perspectives. Shared understanding is expected to increase the likelihood of reaching mutual agreement, definition of a common goal, and decision-making to advance these. Studies of social learning often refer to theories of “communicative action” (Kenter, Reed, & Fazey, 2016) and “transformative learning” (Muro & Jeffrey, 2008). That is, by communicating with others, individuals question their own assumptions, they gradually change their views, and thus develop a shared understanding of the world. Shared understanding is perceived as a precursor for deliberation and arriving at consensus. However, a shared understanding and consensus may not be achievable, especially if highly contested issues are at stake, if values and beliefs are polarized or deep-rooted (Van Bommel, Röling, Aarts, & Turnhout, 2009), if institutional commitments differ (Allan & Wilson, 2009; Cundill & Rodela, 2012) or if there are asymmetries in power relationships between participants (Lumosi et al., 2019; Rudberg & Smits, 2018). The situational context has a significant influence on behaviors, such that a shared understanding is not a predictor of social change.

The influence of power relations on social learning outcomes is widely acknowledged. Social relations are in a sense, a driver as well as an outcome of social learning. It is often suggested that inclusion of participants with diverse interests and a well-facilitated process are necessary to create a “learning space”, where power is shared and communication is open (Lumosi et al., 2019; Mostert, Craps, & Pahl-Wostl, 2008). At the same time, many studies attribute to social learning, improved relational outcomes such as trust and collaborative relationships (Muro & Jeffrey, 2008). However, the ability of social learning processes to attenuate power asymmetries is not clearly established. Few studies of social learning deal explicitly with power or how differences in power and trust impact social interactions or influence development of a shared understanding (Rodela, 2013; Suškevičs et al., 2018). Domination of social interactions by a few, differences in capacities to exert influence or social politeness can inhibit open communication and learning; worse, views and conflicts could become entrenched (McCullum, Pelletier, Barr, Wilkins, & Habicht, 2004). Very few studies have been able to demonstrate that social learning leads to collective action. One of the most significant critiques of social learning, and participatory processes more generally, is that they ignore the influence of the broader institutional and social context on how learning occurs, what is learned and what becomes of the learning.

Informed by the above debates, our study assumes a modest purview of social learning. We acknowledge that outcomes of social learning are contingent on institutional, cultural, and historical contexts. However, we contend that conditions that foster social learning can be created when learning processes are decoupled from decision-making. When participation does not carry the stakes of arriving at a common understanding or at consensus, for example, a shared value for water, it becomes conducive for participants to express their views openly and be willing to learn from others. Participatory methods (e.g., facilitated workshops) and

tools (approaches that are used in a workshop to enhance exchange) are ways to create such learning spaces and influence interaction between participants.

1.2 | Deliberative dialogue as a driver in social learning processes

As indicated above, social learning is based on dialogue (Ridder et al., 2005). A dialogue is defined by David Bohm (2004) to be a “stream of meaning” that flows between participants. William Isaacs (1999) puts it as “the art of thinking together”. This “art” or “flow” is a communal effort where participants add, learn, and create something new, ideally without coming to any preliminary conclusions or judgements. A successful group dialogue enables participants to get to know each other, to trust each other, and to establish a relationship of knowledge sharing. However, there are differences in the quality and therefore impact of dialogues as the style of interaction affects outcomes of social learning (Metze, 2010). For example, conversations that do not turn into constructive dialogues between water managers, farmers, and nature conservationists can lead to increased conflict and tension (Aarts, 1998; Lems, Aarts, & Woerkum, 2013).

Drawing on the work of Habermas, the quality of a dialogue is related to the concept of “deliberation” in which participants commit themselves to explaining and justifying their positions (Habermas, 1998). The intention of a deliberative dialogue is learning from and with others by sharing and explaining beliefs, values, and preferences (Lo, 2011). Deliberative dialogue is inclusive, open, accountable, reciprocal (Hajer & Versteeg, 2005), and vital for understanding complex issues and perceptions (Dryzek, 2006). Habermas (2008, p. 50) outlines four conditions for deliberation: (a) inclusive, that is, no one capable of making a relevant contribution has been excluded; (b) equal rights to engage, that is, participants have the same opportunity to speak; (c) exclusion of deceptions and illusion, that is, participants are free to speak their honest opinion and must mean what they say; and (d) absence of coercion, that is, communication is free of restrictions in discourse and procedures. Although there is limited explicit reference to social learning in Habermas' work, social learning scholars specifically highlight Habermas' interpretation of deliberation as a key driver of social learning processes (Dore, 2014; Kenter et al., 2016; McCrum et al., 2009; Ranger et al., 2016; Reed et al., 2010; Rodela, 2013) and of participatory valuation (Kenter, Reed, & Fazey, 2016; Orchard-Webb, Kenter, Bryce, & Church, 2016).

Critics of Habermas reject the conditions for deliberation as fictions (Flyvbjerg, 1998). Power relations in particular can negatively influence the conditions to have a deliberative dialogue and learning (Orchard-Webb et al., 2016; Van Bommel et al., 2009). We take Habermasian conditions as ideals rather than features of real-world action situations. They are things to aim for, to evaluate against, and to help assess whether conditions were created for a deliberative dialogue. We acknowledge the influence of power relations on learning outcomes. To an extent, outcomes of social learning processes are dependent on effective power sharing (Allan & Wilson, 2009). In deliberative settings, power is often expressed through information,

that is, the types (what) and sources (who) of information that are included or privileged. Kenter, Reed, and Fazey (2016) identify facilitation and process design as meta factors that can balance power, for example, by drawing out information from those who are less confident or by over-representing less powerful voices.

Deliberation is about making values more explicit and contestable so that they can be discussed and evaluated in an open manner (Kenter, Reed, & Fazey, 2016). In that regard, crossover points serve as a useful tool to make assumptions and reasoning explicit within a group dialogue. A crossover point is a point of indifference; the threshold where two alternatives are equally preferred, for example, to buy or not to buy water. Crossover points have previously been used as a tool to examine the effects of assumptions in cost calculations (Arshad, Guillaume, & Ross, 2014; Griffin, 2006; Guillaume, Arshad, Jakeman, Jalava, & Kummu, 2016). More recently, crossover points were used in a participatory setting to examine personal reasoning associated with preferences for irrigation water sources and willingness to pay for irrigation water (Nikkels et al., 2019; Nikkels, Guillaume, Leith, & Hellegers, 2019). Water valuation with stakeholders provides a means to share insights and incorporate the knowledge and expertise of diverse participants (Hermans et al., 2006). In a workshop setting, differences in crossover points within the group provide the starting point for a facilitated and structured dialogue to explore where these differences come from which may be conducive for social learning to occur.

1.3 | Evaluating outcomes of social learning

The first question of concern when assessing and evaluating a process aimed at social learning is whether learning has occurred, as participating does not necessarily mean learning (Collins & Ison, 2009). Outcomes can be tangible or intangible and they can develop over time (Bull, Petts, & Evans, 2008). So, outcomes are hard to assess and it can be too early, or too late to evaluate them fully (Forester, 1999). Therefore, Webber and Ison (1995) recommended evaluation both during and after the workshop and warn against selecting a narrow set of indicators to assess outcomes.

To assess social learning, the process—including the drivers for a successful learning opportunity—and outcomes can be evaluated. (Kenter, Reed, & Fazey, 2016; Siebenhüner et al., 2016). Scholz et al. (2014) provide an analytical framework to assess outcomes of social learning facilitated by participatory methods. They focus on three domains:

1. Relational outcomes, indicated by a creation of trust, and the change in network. A change in networks includes newly established relationships, changing roles within an existing network or the ability to cooperate within a network.
2. Shared understanding, indicated by convergence in mental models of actors.
3. Substantive outcomes, indicated by follow-up actions, ongoing discussions, and new rules.

Scholz et al. (2014) relate shared understanding to convergence of learning, as in the integration of concepts learned from one another or the development of new shared concepts. However, they also acknowledge that divergence in opinions about a situation can be useful for constructive dialogue. Our position is that divergence of positions can be as meaningful as convergence of understanding. We see diverging valuation as a worthwhile outcome of social learning processes, that is, participants still disagree but better understand others and respect others' valuation more (see e.g., Barraclough (2013) and Nikkels, Guillaume, Leith, and Hellegers (2019)).

Substantive outcomes outlined in the framework above imply an effect beyond the actors directly involved, which is a requisite of the social learning definition of Reed et al. (2010). The attribution of long-term outcomes is arguably the most challenging aspect of evaluating social learning processes. Outcomes are contingent upon and confounded by institutional, cultural and historical factors that are external to the learning process (Lumosi et al., 2019). Nonetheless, the identification of change in understanding at the individual level is an important first step before the learning can be extended to wider networks (Bentley Brymer, Wulforst, & Brunson, 2018). Limiting the assessment to one learning event (such as a workshop) is also a reasonable strategy to deal with the complexity of confounding contextual factors (Scholz et al., 2014).

2 | METHODOLOGY

To assess whether social learning occurred during a participatory water valuation workshop, we draw on the framework of Scholz et al. (2014). Unlike Scholz et al. (2014), our focus is not on converging personal mental models or developing understanding of a biophysical or technical system. In our case, the focus is on the personal valuation of water and the reasoning behind it. In a participatory water valuation workshop, a shared understanding may not necessarily mean convergent understanding. Participants learn about their own valuation within a group, but also about others' valuation of water. This includes learning from the group about how valuation changes the perceptions of the group, its members, or oneself. Despite the difference in focus on the form of learning, the approach of Scholz et al. (2014) remains useful in examining the indicators of outcomes in one or more domains—relational outcomes, shared understanding, and substantive outcomes (see Table 1). This approach would classify as individual centred (Rodela, 2011), an approach that can be linked to literature on deliberation and communicative action (Rodela, 2013).

For the drivers that influence outcomes of a process aimed at social learning, we draw on the work of Habermas, and more specifically on Kenter, Reed, and Fazey (2016) and de Vente et al. (2016). Kenter, Reed, and Fazey (2016) provide a theoretical approach for Deliberative Value Formation (DVF) of ecosystem services. DVF links deliberative valuation to social learning (Kenter, 2017). In DVF, deliberation is about forming, expressing, debating and learning about values, and beliefs in a group setting. Such deliberation builds on the ideal speech conditions of Habermas and is characterized by an equal

TABLE 1 Drivers and outcomes of processes aimed at social learning, adapted from de Vente, Reed, Stringer, Valente, and Newig (2016), Kenter, Reed, and Fazey (2016), and Scholz et al. (2014)

Drivers	Indicated by	Outcomes	Indicated by
Deliberative dialogue	Conditions for a deliberative dialogue to occur Participatory tool(s) contributing to the dialogue Appropriate facilitation	Relational outcomes	Creation of trust Change in network
Process design and facilitation	Willingness to recommend to others willingness to participate in another event	Shared understanding	Change in personal understanding/thinking/reasoning Change in the perception of the understanding/thinking/reasoning/perspective of others
		Substantive outcomes	Ongoing discussion beyond the participants involved Initiation of projects/actions/follow-ups

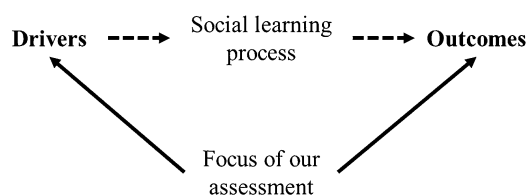


FIGURE 1 Methodological Conceptual framework of approach of indirectly assessing social learning by focussing onto assess drivers and outcomes of processes aiming at social learning

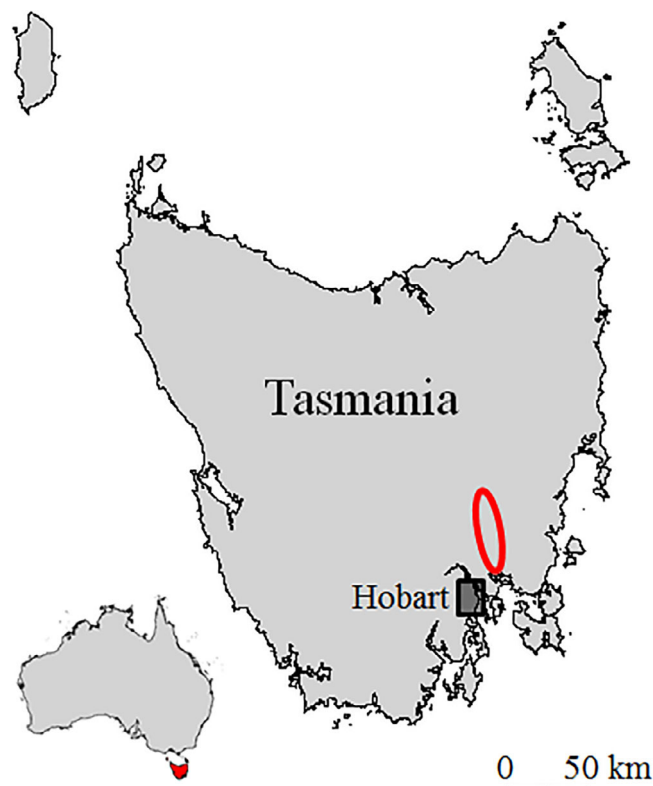


FIGURE 2 Case study area in the red circle [Color figure can be viewed at wileyonlinelibrary.com]

ability to engage and an honest and open exchange of perspectives. To assess deliberative dialogue as a driver of social learning, we made use of indicators. We asked workshop participants to reflect on the process and specifically asked about their engagement, their willingness to listen openly, their ability to talk honestly about (reasoning behind) preferences and their perception that others were honest as well. de Vente et al. (2016) provide seven recommendations for participatory processes designed to foster social learning, of which process design—including group composition, location, and participatory tools—and facilitation are considered the two most important factors. We also evaluated personal appreciation of the workshop to capture perceived usefulness, including the added value of the participatory tool. Appreciation of the workshop process, captured by willingness to recommend the workshop and to participate in future workshops, is a meaningful indicator to evaluate the design and facilitation of participative processes (Nikkels, Guillaume, Leith, Mendham, et al., 2019; Ridder et al., 2005). See Appendix B.1–B.3 for the specific questions asked.

So, we do not focus on “how” learning took place but instead, we assess (a) the drivers to facilitate an opportunity for social learning to occur and (b) outcomes in one or more domains (Figure 1). As both outcomes and the perceived drivers that influenced the learning process may change over time, the evaluation process contained three evaluation moments.

2.1 | Case study

The South East irrigation district (Figure 2) is a prime agricultural area in Tasmania, Australia. There are currently multiple, distinct water sources in the valley, including water from the Craighourne dam (SE1), treated waste water, and South East Stage 3 (SE3). SE1 was constructed in 1985/1986. It is the oldest and first communal source of irrigation water that farmers invested in (Tasmanian Irrigation, 2019c). Treated waste water currently comes from the nearby municipality (Clarence), but the cities of Hobart and Glenorchy might provide a future extension of this water source (Tasmanian Irrigation, 2019a). Water in the SE3 scheme is sourced from the Derwent River, which has the potential to sustainably provide much more irrigation water



than it currently does (Tasmanian Irrigation, 2019b). SE3 is the newest source of irrigation water in the district (commencing operation in 2015) and the most expensive water in the State (Tasmanian Irrigation, 2017).

The district is seen as an example for other areas in Tasmania to better understand the societal changes associated with shifting from dryland cropping into irrigation (Nelle, 2010). This is particularly relevant in the Tasmanian setting as there are long term policy objectives to increase the annual value production of the agricultural sector from \$1.8 billion in 2012 (Australian Bureau of Statistics, 2013) to \$10 billion by 2050 through irrigation and innovation (DPIPWE, 2017). This long-term objective results in government initiatives to build new irrigation schemes to facilitate a transformation from dryland cropping to more intensified forms of agriculture that need irrigation water.

The current approach to design of new irrigation schemes includes a feasibility phase where farmers must commit to buying water entitlements. This first commitment defines the design of the scheme and the diameter (supply capacity) of the irrigation pipes. As such, current water demand of farmers, even if they are inexperienced irrigators, influences the long-term water availability in the district. Information provided to potential irrigators is strongly focussed on marginal benefits, while farmers indicate that their investment decisions go beyond short term profits (Nikkels, Guillaume, Leith, & Hellegers, 2019).

The demand for water in the district, in terms of both quality and quantity, is continuing to increase, and the uptake of SE3 water suggests an increasing willingness to pay for water. As both demand and willingness to pay seem to change over time, we assume the farmers and water managers in the district have valuable knowledge and experience that may be useful to improve the management and governance of water in other parts of Tasmania. However, learning processes are currently lacking in the Tasmanian approach to designing and managing joint irrigation infrastructure (Nikkels, Kumar, & Meinke, 2019).

2.2 | Participatory crossover analysis as a tool to foster dialogue

Crossover questions with a monetary focus were used as prompts for group dialogue concerning the reasons behind the selection of answers to each question. The workshop sequentially ran through a series of multiple choice crossover questions. Using an audience polling tool (Turning Technologies, 2019) with PowerPoint slides, participants were asked to indicate their personal crossover point to a question (e.g., participants' willingness to pay for water that is provided with 95% surety and of high quality). Anonymized answers were displayed immediately following polling as a frequency distribution and these slides became the starting point: a strawman to encourage sharing knowledge, perspectives, and preferences. The facilitator (first author) asked for a volunteer to explain why they had chosen their personal crossover point. Further "why" questions followed, opening up inquiry into underlying personal reasoning.

2.3 | Workshop design

The 3 hr workshop took place on a Thursday evening, May 3, 2018. See Appendix A for a step-by-step workshop outline. The workshop was designed to foster dialogue among a heterogeneous group of participants with deep knowledge of water use, management, and governance.

Besides using participatory crossover analysis as a tool, we took several workshop design decisions to enhance conditions for a deliberative dialogue in line with the process drivers outlined above:

1. Recruitment and selection of participants: We contacted the chairpersons of the SE1, the waste-water, and the SE3 irrigator groups. With their permission, we contacted the scheme managers active in the area and the policymakers working on relevant water policies. To include a broader set of perspectives contributing to the dialogue, we encouraged all invited participants to bring a colleague to provide peer support. Four farmers, an irrigation scheme manager, two private sector water consultants with experience in developing and managing irrigation schemes, and one policy maker were able to attend the workshop. Most of the eight attendees knew each other but the policymaker met some of the participants for the first time.
2. Creating a safe space: With the aim of creating a setting in which participants felt safe and free to speak, the workshop was held in a neutral space within the district (Sorrel Training Centre). Participants had the opportunity to informally familiarize themselves with each other. We used an icebreaker question to get everybody involved and checked whether everybody felt comfortable to participate.
3. Stated aim of the workshop: The workshop aimed to provide a learning opportunity and was decoupled from decision-making. The facilitator started by stating the aim and explaining the rules/conditions for the dialogue. The stated aim was "to support a dialogue among farmers, water managers, and policy makers about the costs and benefits of irrigation water, in order to learn from each other's insights and reasoning. This means that there is no best, or optimum or right or wrong." (see Appendix A. The dialogue among participants was introduced as informal, nonbinding, and not seeking consensus. Such dialogue might lead to a better and shared understanding, acceptance of differences, and insights that can result in better water planning and management.
4. Familiarity: The facilitator knew all the participants personally and had established a relationship during previous workshops in the district. A trusting relationship between scientist (in their role as facilitators) and participants influences both process and outcomes (Lemos et al., 2018; Sol et al., 2013). Due to his research interest in the area, the facilitator was expected to be able to follow and steer the detailed content (see Appendix C) and relate to topics covered in previous workshops, see Nikkels, Guillaume, Leith, and Hellegers (2019) and Nikkels, Guillaume, Leith, Mendham, et al. (2019).

2.4 | Data collection and analysis

To capture emerging outcomes, the evaluation process contained three evaluation moments, spread over 6 months, see Figure 3. A note taker (second author) took notes during the workshop and closed the evening by facilitating a thirty-minute exit survey and discussion to provide preliminary feedback on the process ($n = 8$). Participants answered multiple choice questions, again using TurningPoint audience response software and clickers, and shared their first reflections on the workshop in the group. The questions included whether participants were comfortable to share their reasoning, whether they believed others in the group were honest during the workshop, and whether they would recommend the workshop to others (Appendix B.1). A more detailed follow-up, in the form of semistructured telephone interviews, 3 and 5 weeks after the workshop focussed on the process, and on social learning related outcomes ($n = 8$). These 10 to 20 minute telephone interviews (conducted by second author) contained questions focussed on the value of the crossover concept for participants, and the value of the group discussion (see Appendix B.2). Participants were asked what they remembered as particularly useful or interesting, about the perceived usefulness/value of the discussion to themselves and to others, whether they would recommend the workshop and participate in future workshops, and if/how the workshop changed the participant's reasoning/understanding.

To account for any outcomes that might have emerged over a longer time, the first author interviewed participants 6 months after the workshop. Semi structured face-to-face interviews contained open questions on the perceived outcomes and whether or not the focus on crossover points contributed to the dialogue and value of the workshop (Appendix B.3). The interviews lasted between 20 and 40 min. Six out of eight participants could be reached. The exit survey and both interview rounds were transcribed verbatim and analyzed using a deductive coding frame derived from drivers and outcomes and associated indicators in Table 1.

3 | RESULTS

Water-related insights, including the crossover points, can be found in Appendix C; here we focus on the drivers and outcomes of the workshop.

3.1 | Drivers

3.1.1 | Deliberative dialogue

Participants' responses at the beginning and end of the workshop, and their answers in both semistructured interviews suggest that we succeeded in providing a deliberative dialogue situation for all participants. Responses to exit survey questions (directly following the workshop) indicated that participants felt safe, able to share their reasoning, and willing to listen to each other. One participant put it as follows: "I think it was basically that people were prepared to listen to other people. There was no argument. No one said no, that is bullshit. You might have thought it was bullshit, or it does not suit or fit with

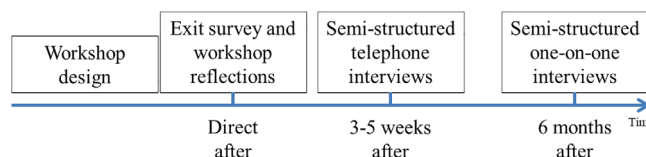


FIGURE 3 Timeline with evaluation moments [Color figure can be viewed at wileyonlinelibrary.com]

how I think but everyone was mature enough, listened, and maybe changed a bit." Respect for (the reasoning) of others was perceived as a key success factor: All participants agreed that the dialogue was respectful ("round table dialogue" as one participant described it). Respect went beyond agreeing with each other, "there was respect, whether you agreed or dis-agreed, there was respect." Participants felt comfortable talking honestly and freely about preferences and personal reasoning, and they were confident others were honest during the discussion with reasoning of others being perceived as logical or valid.

Crossover points were used as a tool to contribute to the dialogue by encouraging to share knowledge, perspectives, and preferences. Immediately after the workshop, the perceived contribution of crossover points to the dialogue varied among participants. Most (7 out of 8) agreed that it added "something", but it turned out to be difficult to put a finger on "what it added." The questions were described as ambiguous by some. However, this ambiguity was perceived by others as a key strength of the tool, as it encouraged explaining why the question is ambiguous: What factors play a role and how do these factors differ among participants? The anonymous crossover point indications were appreciated as discussion starters, and not as end results. Indicating personal crossover points and then—by asking "why?" questions—focussing on underlying reasoning helped in sharing and explaining personal values, beliefs, and preferences. One participant said that the displayed crossover points provided a platform from which the conversation could take off: "What it added was that you thought of an answer and then you looked at everyone else's and it added people's rationale behind the information that they were providing and that in turn prompted further discussions as to why they felt those answers were valid. So it provided a very good forum for providing information, for extracting honest information from people and then instantly, it provided a basis for follow-up discussion." During the workshop reflection, participants expressed the view that the alternative of a general discussion would have been inferior as it would not have had the depth and explorative character.

During the two interview rounds, all participants indicated that they appreciated the dialogue and appeared to be more positive, compared to immediately after the workshop, about crossover analysis as a participatory tool, as it provided a structured start to the discussion and forced everyone to actively participate and share their own views on a common topic, that is, what they would be willing to pay for water and why. This enabled the opinion of every attendee to be represented on an equal footing at the start. All participants agreed that

the tool supported engagement and directed the discourse away from discussing and defending positions: “There was no right or wrong. It was genuinely participatory and that developed trust and engagement. I thought it worked exceptionally well.” Another participant expressed it as clever: “It was cleverly structured to encourage exploring your own viewpoint. Honest discussion of your own viewpoint, which was useful in the end, as it helped to understand why people had different ideas on the same topic.”

3.1.2 | Process design and facilitation

All participants perceived the workshop as being worthwhile. While most (7 out of 8) indicated that the workshop helped to inform how they valued water, participants varied in ability to explain what they learned. For some, the value was in confirming their ideas while for others, the value was in hearing and learning from the different perspectives and getting new information: “I took away a lot of value out of the workshop but talking to other participants, they also did as well. For different reasons, such as understanding different points of view and opportunities for their business.” During the face-to-face interviews, all participants indicated that they would participate in a similar workshop and that they would recommend others to do so as well.

Participants mentioned group composition as one of the factors that positively influenced the process. It turned out that due to their long-term involvement in water management that came with a certain maturity in understanding of water, participants felt that other group members added to the depth and quality of the dialogue. During the telephone interviews, one of the participants shared that they had discussed the workshop afterwards and that they agreed that “if there were three or four other people that could have been there, the meeting would have been quite different.” As all participants had a common interest or view on the importance of agriculture and irrigation, discussions at the workshop could probe deeper into rationales behind preferences that varied. The small group meant the facilitator was able to draw out views from participants who were reluctant to speak and participants were able to explain and listen to different views without being rushed.

The stated aim of the workshop, being learning from and with each other without having to make a decision, turned out to be beneficial for the process. One participant explicitly expressed interest in repeating the workshop every 6 months to continue to learn with and from each other in this particular setting without making decisions: “Not so much to set policy or anything but just as lateral thinking sort of group; brainstorming.” Six months after, the policymaker thought that such workshops would be valuable in preplanning stages but was not sure how it contributes to decision-making: “I think it is valuable in the initial stages of evaluation and consultation for policy and planning. I am not sure how this process applies for a later stage, when you are getting down to a more targeted and purposeful discussion about implementing something. I think it useful in the preliminary stage.” Several other participants mentioned that they could speak freely but that it would be difficult to repeat such workshops with

other participants, in a planning context or if it were facilitated by the government. One of the participants summed up some key points for success: “I think there would be value for it [running similar workshops] but again I think the best value is when people speak openly and not trying to run a particular agenda above others. If it was run by a third party in a certain situation, where it is agreed that this is just getting background information.”

All participants agreed that the facilitation and pace of the workshop was appropriate for the content and group. During the interviews, the established relationship with the facilitator during previous workshops was mentioned as a contributing factor: “I think there is merit in making sure that there is a prior relationship and understanding with those in a workshop as detailed as that.”

3.2 | Outcomes

3.2.1 | Relational outcomes

Participants were mixed in their reflections on whether the workshop extended their network. One participant knew all other participants beforehand, but the others got to know new people. All indicated in the face-to-face interviews (6 months after the workshop) that it would be easier to collaborate in the future, which was an important outcome and a reason to repeat such processes for the attending policy maker. For some, the improved ability to collaborate had to do with empathy, while others mentioned the bonding effect of having a common understanding: “The common framework and some common assumptions are there. You don't have to convince those people again” and “I think the opportunity to have open and frank discussions with them exist now more so than it did prior. To have the policymaker in the room and understand viewpoints of end-users is just invaluable.”

3.2.2 | Shared understanding

All participants indicated that they either learned about their own valuation or about others' valuation of water. Straight after the workshop, all participants indicated that the workshop informed their thinking about costs and benefits of irrigation water. The following two quotes, captured during the telephone and the face-to-face interviews, illustrate the personal and broad nature of the indicated changes in understanding: “I think in terms of outcomes that I gained some different perspectives and completely new understanding for water value” and “Thinking about other people's perceptions, I thought was really valuable. The farming members of the group were quite alive to the fact that in the long term, water means change. I imagine that this is a very challenging thought for a lot of farmers that see themselves as intergenerational custodians, where their identity is intertwined with their land and what they do. I thought that was very interesting and not explicitly discussed often in relation to the development of these schemes.” Some believed that the learning in the

workshop varied per person and that others learned more than they learned themselves. This learning did not necessarily mean that their current valuation of water converged but instead, it provided a broader understanding. However, there was a strong consensus about a significant increase in the purchase price of water rights within the next 10 years. Six months after the workshop, this was often mentioned as the most remarkable insight. For example: “I think, the biggest discussion point that came out is that the perceived value of water has definitely changed in a short space of time.”

3.2.3 | Substantive outcomes

The workshop led to substantive outcomes, which emerged over time. In the exit survey after the workshop, three participants indicated that the insights of the workshop would have direct impact on their jobs. A consultant said what he learned at the workshop would directly inform a report he was writing, a manager hoped to encourage more future-oriented planning within his organisation, while the policy maker was keen to apply similar methods to make government consultations less adversarial and more supportive of learning. During telephone interviews, the policy maker explained that he perceived the workshop as very valuable, as “it allows policy makers to understand the relevant issues for stakeholders, which can potentially improve policy making”. He continued to explore insights gained from the workshop and initiated discussion sessions within his department. Within 6 months after the workshop, a new pre-planning stage was introduced in the state's statutory water management planning process to “engage with local people, representative bodies and relevant water entities ... to find out what community members and other interested parties think the issues are” (Guidelines, p. 6). The second and third authors of this paper were engaged to facilitate a pre-planning inquiry in the North-West of Tasmania. The policy maker attributes these changes directly to his experience at the workshop in the South East Irrigation district.

One of the farmers indicated 6 months later he did not buy more water rights but that the insights of the workshop influenced him in his role in various farmer committees. Instead of looking at the value of water for his own enterprise, he now considers the value of water for other farmers, for example when irrigating high value crops, and incorporates the (possible) future directions of the price of water in his reasoning. Another farmer indicated that it was important to keep on sharing their local knowledge in such settings as understanding the viewpoints of other stakeholders was “invaluable in the process going forward.”

Not all outcomes played out as anticipated. The consultant who expected the learning from the workshop to influence a report did not identify the same as an outcome when interviewed 6 months later. For him, a lasting outcome was a change in the approach to informing farmers, “how to get information out of people when you don't necessarily want to give it to them and also some of the things about understanding values of water.” One of the private water consultants indicated that since the workshop, he

was more confident to advise farmers to invest in water, even if the (current) numbers do not stack up: “It has broadened our advice, I think it helped us to help our clients change the way they think about irrigation development.”

We found that most substantive outcomes, such as changes in the approach to water governance, only became tangible over time, and were evident in interviews 6 months after the workshop but not earlier. In each instance, the outcomes were facilitated by individuals who attended the workshop, either through a change in their understanding about the value of water that was then carried forward into their respective roles as managers, consultants and farmer representatives, or as a desire to create similar learning experiences in other contexts.

4 | DISCUSSION

Based on our evaluation, which was spread over 6 months, we find that a single workshop had outcomes in all three social learning domains of Scholz et al. (2014), namely relational outcomes, shared understanding, and substantive outcomes. We built on the work of de Vente et al. (2016), Kenter, Reed, and Fazey (2016); Scholz et al. (2014) to identify meaningful indicators of social learning. We assessed outcomes and drivers affecting social learning processes by asking for the perceptions of participants. Doing so, we aimed to capture drivers and outcomes of social learning, as perceived by participants themselves, instead of directly assessing learning through pre and post measurements, as in for example, Raadgever et al. (2012); van der Wal et al. (2014) or merely through observations of researchers/facilitators, see for example, Sol et al. (2013) and Bentley Brymer et al. (2018). Our approach is prone to biases (e.g., hindsight bias, see Kahneman (2011) and Beratan (2007)) and should therefore not be used to assess “how” learning took place. In addition, it is not possible to inventory and separate relevant factors with the rigour required for causal claims as alternative explanations cannot be eliminated (Kampen & Tamas, 2014). Nonetheless, we show that the workshop was successful in creating drivers for social learning and led to enduring outcomes.

In the introduction section, we introduced three interrelated issues of ongoing debate in the social learning literature: converging perspectives, power asymmetries, and time taken for social learning to occur. Here, we briefly discuss these issues and how they were addressed in our case study.

On converging perspectives: Diversity of perspectives is often identified as a necessary element of social learning processes (Bentley Brymer et al., 2018; Ensor & Harvey, 2015), which are then evaluated on their ability to generate a shared understanding and consensus. We argue, along with Siddiki, Kim, and Leach (2017), that increasing diversity of stakeholders can have both positive as and negative influences on learning. In our case study, including people from the local government and nature conservation groups would diversify group composition and might have enriched the dialogue further (inclusivity is one of the conditions for the ideal speech situation, see



Habermas (2008)). However, including a larger number of participants is likely to have limited their ability to engage in dialogue, that is, to get to know each other, build trust and share knowledge. In a small group, participants had sufficient time to explain their reasoning and engage in debate. As participants themselves acknowledged, familiarity among participants and the facilitator, and common depth of experience created an environment of mutual respect. Even the policymaker, who did not bring peer-support and lacked in-depth knowledge of the district, felt safe, heard, and respected. Broadening the set of stakeholders provides a fruitful avenue to further explore the applicability of workshops aimed at social learning and is vital if aiming for widespread understanding of complex issues (Dore, 2014).

Although mutual agreement was not stated as an aim of the workshop, a shared understanding emerged about a steep increase in the purchase price of water rights in the coming years. This is not to suggest there was no diversity in perspectives. Participants held different views on the drivers of change, on what water could be used for, on the seasonal value of water, on the value placed on surety of supply, and on policy and funding constraints. Participants learned about their own valuation within the group, but also about others' valuation of water.

On power asymmetries: Three key factors influenced power relations and quality of dialogue in our workshop: the stated aim; the tool used; and the role and approach used by the facilitator. First and foremost, our workshop did not aim at arriving at a consensus or an agreed decision. Decoupling learning from decision-making can help to steer the discourse away from strategic calculative reasoning (see, e.g., Barraclough (2013) and Dryzek (2006)). In our case, the absence of an agenda or an impending decision moment prevented participants from pushing or defending their own interest; it enabled open dialogue between participants with different interests, knowledge or power to influence decisions. Despite having no direct link with joint decision-making, Pahl-Wostl (2017) considers informal sharing and integration of knowledge essential for improving regional water management and governance. In policy or planning contexts, we propose that processes to foster learning be separated from decision-making processes, allowing people to first learn about and from each other in non-adversarial settings before being asked to represent their interest or negotiate with others. Second, such processes can be enabled by appropriate tools such as participatory crossover analysis, which help to structure a deliberative dialogue—a key requirement for social learning (Kenter, Reed, & Fazey, 2016). In our case, anonymized crossover points used at the start of the workshop provided an opportunity for all participants to engage anonymously and then served as a basis for enquiring about reasoning for choices in a nonjudgemental way. Notwithstanding some early confusion about the crossover questions, participants highlighted the tool's value in drawing out latent values and reasoned opinions in an inclusive setting.

Third, the role and capacity of a facilitator is widely acknowledged to be crucial to the success of dialogue and deliberative practice (de Vente et al., 2016; Tschirhart et al., 2016). In this case, the facilitator's prior knowledge and previously established relationships were noted as beneficial to his role in the process. The approach used for facilitating this workshop could be described as integrative, as the

focus was on participants' interests, the reasons behind these interests, values and personal perceptions (Groot & Maarleveld, 2000). Rules for deliberative dialogue (see Appendix A) were communicated early in the process and the facilitator intervened at several points to get quieter participants to share their views. During the workshop, no single source of knowledge was privileged; no weights were placed on values; and no judgements were made on accuracy or validity. These three features—decoupling learning from decision-making, use of crossover points and integrative facilitation—prevented preexisting power asymmetries from adversely affecting the quality of learning. While we are unsure if similar outcomes could be attained when participants hold polarized opinions, there are clear enduring benefits when the group is small, the participants have different but not polarized opinions, and the facilitation is integrative.

On time taken for social learning to occur: Social learning processes are often referred to as long lasting, requiring multiple stages (e.g., Johannessen & Hahn, 2013; Ridder et al., 2005; Van Bommel et al., 2009). Some scholars have argued that only intensive, continuous processes lead to learning (Raadgever et al., 2012). Sol et al. (2013) argue that in these long-lasting processes, a single workshop can cause significant and enduring shifts, but they still evaluate the overall process. In assessing the social learning potential of a single workshop, we were able to identify substantive outcomes that were directly attributed to the single workshop by participants. To assess the social learning potential of short-term processes, or in our case a single workshop, the evaluation process needs to be designed to capture outcomes that emerge over time, which is in line with Bull et al. (2008); Ernst (2019); McCrum et al. (2009). For example, the change in engagement procedures for water management policy was a significant outcome that was evident only months after the workshop.

As outlined earlier (Section 1.2), it is challenging to assess if a social learning process has led to collective action or improved natural resource management (Muro & Jeffrey, 2008; Suškevičs et al., 2018). For example, Rudberg and Smits (2018) reflect on a social learning process that ran for 10 years in Sweden, and conclude that no substantive outcomes emerged for natural resource management although other relational and knowledge outcomes were observed. Indeed, in our case as well, beyond a change in understanding of participants, the most tangible substantive outcome was the inclusion of a pre-planning learning approach within the water management planning process. It is difficult to assess if preplanning will directly contribute towards better planning outcomes due to the confounding influence of other factors. As Rudberg and Smits (2018) found, power imbalances in institutional arrangements may limit the realization of benefits in full. With the benefit of hindsight, we propose that a critical approach to evaluation (such as Rudberg and Smits (2018) or Reynolds (2007)) would help to identify contextual factors that prevent outcomes from being realized.

All the substantive outcomes of our workshop were a direct result of a change in understanding of individuals who participated in the workshop. The extent to which the learning has gone beyond individuals and become situated within wider social units (Reed et al., 2010) is unknown and arguably cannot be attributed to any one social learning process.

Unless the wider institutional and cultural environment is favorable, social learning processes are unlikely to lead to sustained outcomes (Allan & Wilson, 2009). This does not negate the outcomes achieved in a single process. Our study shows that even a single process can be influential if it leads to a shift in understanding of individuals who are then able to apply it to their jobs, albeit in a slow and unpredictable manner.

5 | CONCLUSION

The proposition we examined in this paper is that a single, well-designed water valuation workshop can foster social learning. Our assessment focussed on drivers and outcomes of social learning. Drivers positively influence the conditions for learning and outcomes are indications that learning occurred.

The evaluation process contained three evaluation moments, spread over 6 months. The evaluation data in our case study suggest that the participatory water valuation workshop succeeded in providing conditions for social learning: Participants indicated that both the facilitator and the applied participatory valuation tool positively influenced the deliberative dialogue among participants. Participants felt safe, listened to each other, respected perspectives, and committed to explaining their reasoning without trying to convince others. In addition, we found indicators that the workshop resulted in shared understanding, relational, and substantive outcomes. We therefore conclude that social learning is very likely to have occurred during a single workshop. This is noteworthy, because social learning is often assumed to require long lasting, intensive interactions. We found that most substantive outcomes became evident in the interviews 6 months after the workshop but not earlier. This supports our argument that evaluation processes need to be designed to capture emerging outcomes.

We contend that not having to make a decision or arrive at a common understanding is conducive for social learning to occur. According to the participants, the workshop made it easier to collaborate in the future, partly because they established a shared understanding of the future value of water but also because the workshop created respect and empathy for (the perspectives of) others. Our study suggests that learning processes held with small groups and decoupled from decision-making, encourage appreciation of plurality of perspectives and foster a culture of learning among participants. The eight workshop participants, being farmers, water managers, and a policy maker, learned together and continued to discuss and explore the covered topics with others. Six months after the workshop there still was clear enthusiasm to continue social learning. In water policy and planning contexts with diverse values at stake, we encourage design of learning experiences in small groups with shared interests as a precursor to larger groups where values need to be negotiated and decisions made. Further research is required to assess if such a separation between learning and decision-making could help to diffuse entrenched conflicts and encourage learning in future water planning and management processes.

Our evaluation approach provides preliminary insights to promote the uptake, funding, and acknowledgement of social learning processes and so further testing in additional case studies appears to be

worthwhile. Our findings suggest that participatory water valuation workshops are not only useful for their valuation outcomes, but that they can also foster social learning among participants.

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APPENDIX A: WORKSHOP PLANNING

Place: Sorell Training Centre

Date: May 2018

18:45 for 19:00 start

Facilitator welcomes everyone when entering by shaking hands (acknowledge). Tea, coffee and Dutch cookies are provided near the entrance. Next to the coffee and tea, are stickers so participants can write their first names to make name tags. After coffee and tea, in which the participants have the chance to familiarize, they are seated in a half circle with a screen and projector at the open end.

19:05

Facilitator starts by thanking everybody for coming, introduces the note taker and explains the rules/conditions and the aim without being directive/demanding:

“The aim of tonight is to support a dialogue among farmers, water managers, and policy makers about the costs and benefits of irrigation water, in order to learn from each other’s insights, and reasoning. This means that there is no best, or optimum or right or wrong. The previous discussions showed that everyone had personal reasoning that was different from their neighbors. If you bring people with different backgrounds together, it is likely that their reasoning is quite different which might be interesting for the discussion. So, tonight we will find out if it actually works to talk about water and the price of irrigation water among people with a different background. We will make use of crossover points. Crossover points or tipping points are the point where two alternatives have the same preference. It is a maximum or minimum you are willing to pay. The points provide limited insight. They are used as strawmen to encourage personal reasoning. The dialogue of tonight is informal, non-binding and we are not seeking consensus. We do not have to agree with each other. It is about sharing. You take with you what you want and leave this room again. We do not have to find solutions, or become best friends. I hope to provide an opportunity in which we can talk freely about personal perspectives. Is that clear? Are there any questions?”

Ice breaker question

French fries are best with? Mayonnaise/Ketchup/Curry Gewurz/ Satay Sauce/Mayonnaise, Ketchup and Onions/Gravy/Gravy and cheese curds/No sauce/I just nibble on raw veggies, seeds, and nuts.

Dialogue conditions

I feel comfortable to talk about the cost and benefits of irrigation water in this group? Strongly agree/Agree/Neither agree nor disagree/Disagree/Strongly disagree

Is there anything we can do here and now to improve the situation before we start discussing?

Explain the crossover concept and introduce the steps.

Display table with characteristics of water sources and discuss.

		Craigbourne dam	SE3	Reuse
Costs	Capital costs/ml (water rights)	\$1,000 – \$2,500	\$2,500 – \$2,700	0
	Annual costs/ml	\$105 plus pumping (up to \$150)	\$140 fixed + \$178 – \$220 variable	\$10 – \$70 (plus pumping)
Quality		Variable but often too poor/salty for sensitive crops	Almost drinking water quality	Comes with restrictions on use
Reliability		60–90%	95%	80–99%

Crossover question (CQ) 1

What is the maximum price for a water right that you/a farmer can pay for water that is provided with 95% surety and of high quality? Why?

Follow up:

1. How do yearly costs influence the willingness to pay for water rights?
2. What do you know now that you wished you knew when setting up (scheme, policy, on farm)?
3. What caused this change in thinking?
4. How did perspectives change?

CQ 2

What is the maximum price for a water right that farmers could be paying for water that is provided with 95% surety and of high quality in 10 years from now? Why?

Follow up:

1. What does this mean for water governance? And water managers?
2. How can the current design strategy be improved?
3. What sort of information would be helpful for farmers who get the opportunity to buy water in the future?
4. What is the long term water demand in the valley?

20:00–20:15 Break: Coffee, tea, and Grolsch

CQ 3

What is the maximum price for a water right that you/a farmer can pay for water that is provided with 80% surety and of high quality? Why?

Follow up:

1. What does 80% mean?
2. What is surety? What is reliability?
3. How does surety affect planning?

CQ 4

What is the maximum price for a water right that you/a farmer can pay for water that is provided with 95% surety and of high quality, provided in the winter? Why?

Follow up:

1. Manageability.
2. What are the most important differences between winter water and summer water?
3. Will current non irrigators buy winter water?
4. Is there enough water to facilitate the valley’s long term potential?

CQ 5

How much value/ml do/does you/a farmer need to generate to make water of \$2,700/ml worthwhile? Why?

Follow up:

1. Is that possible with livestock? Annual crops? Why? How?
2. What can be learned from the Coal river/SE3 experience?
3. Is the Coal river/SE3 relevant for other valleys in the State?

21:00 Evaluation by note taker

21:30–21:45 Wrap up

APPENDIX B

Exit survey and workshop reflections

		Drivers				
		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I felt comfortable to participate in the dialogue		0	0	1	1	6
I believe others in the group were consistently honest throughout the workshop		0	0	0	2	6
I felt able to talk honestly throughout the session talking about my reasoning for preferences		0	0	0	2	6
The focus on crossover point is a valuable way to guide group discussion		0	0	5	3	0
I would recommend this workshop to others		0	0	0	5	3
The workshop facilitation was appropriate for the content and group		0	0	0	5	3
	Too fast	A bit rushed	About right	A bit slow	Very slow	Variable
The pace of the workshop was		0	0	8	0	0
	Outcomes					
	I had not really ever thought about it	About the same as I expected	Slightly different from what I expected	Very different from what I expected		
Other people in the group had crossover points that were:		0	0	5	3	
Other people in the group had reasoning that was:		0	5	3	0	
		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The workshop helped to inform how I value water.		0	0	1	4	3
The outputs of this workshop should be interesting to other audiences.		0	0	1	3	3
The crossover process helped to inform my thinking about the costs and benefits of water.		0	0	0	5	3
If I talk about the workshop to other people it will mostly be positive		0	0	0	3	5

Personal follow-up evaluation questions three to 5 weeks after workshop

[The following questions seek to elicit stand-out memories and get people back to the event and the discussion that was going on there through an inductive open ended approach]

1. What are the parts of the discussion that stood out or that you remember as particularly useful or interesting?
2. What did you learn during the workshop?
3. How do you look back on the workshop? [Follow-up: Why was it valuable/useful/interesting?]

[These questions elicits thinking about the use of process and outputs for learning]

4. What or how did the cross-over points add to the group discussion?
5. Why are crossover points a valuable way to guide group discussion, or why not?

[These questions get towards impact and robustness: change in ways of think and decide]

6. Would you recommend the workshop to others? If so, why?
7. Did you continue the discussion or the thinking process?
 - a. Did this lead to different answers/insight?
 - b. Would you have filled in other values if you could do it again? If so, for which question and why?
8. Are there any ways that you think the cross-over process could be adapted/improved to make it more useful or to achieve its full potential?
 - a. Tips/Tops.

Interview questions 6 months after workshop

Introduction question

1. If you go back to the workshop in May, what stood out or that you remember as particularly useful or interesting?

Drivers

2. Would you be willing to participate in similar workshop in the future? Why? Why not?
3. Did you appreciate “the way” we talked? Why? Why not? What made it that you appreciated it?

Relational outcomes

4. Did the workshop extend your network? If so, who did you not know before?
5. Did the workshop make it easier to collaborate with other participants in the future? If so, why?

Shared understanding and substantive outcomes

6. Did the workshop result in any tangible outcomes such as initiation of projects/actions/follow-ups?
7. Would similar workshops be beneficial for the water sector? Farmers, managers, policymakers? Why, Why not?
8. Are there any other outcomes that you connect to this workshop? If so, how and why?
9. What made it that you valued the workshop (or not) and how did the method contribute to that value?
10. Did we miss anything in the evaluation? Or anything you want to say about the process?

- If having to change enterprise, the cost of water rights may be only half of the total transition costs.
 - If just 10 ml of high security water is added to an existing water allocation, it can provide an insurance policy. It then has value and influence on operational choices that go beyond that 10 ml and might therefore be valued differently (higher).
 - The value of water is market driven and changes over time: “Today, we are basing our decision on what we know now but we already have seen a major shift even since SE3.”
 - In some situations, “the value of the water outweighs the dollar value that is put on it.”
 - Yearly operational costs are of major importance when making an investment decision as it needs to be covered in the yearly budget by the crop that is grown with irrigation water. The combination of water rights and yearly cost determines the (need for) change in enterprise.
 - There are many social factors that determine the value of water. Over time, the value of water changes as people change their expectations and perspectives about what they can do with water. However, investment decisions are based on what people know at the time of investment.
 - Shifting from dry land to irrigation changes comes with lifestyle changes as the energy tariffs (i.e., low cost power) force farmers to work on the weekends. This has strong implications for family life.
 - Long term value of water (rights) is a different line of thought than growing something (making a profit) with that water. Value determination is a personal combination of both long and short term reasoning.
 - Investing in water is believed to be a good long term investment as the market price for water rights is assumed to go up.
2. What is the maximum price for a water right that farmers could be paying for water that is provided with 95% surety and of high quality in 10 years from now?
 - The value of water is changing rapidly, demanding major changes in how it is governed and managed. If there are no major changes in the availability of water, the cost price of water rights will substantially increase, see Figure C1. This notion comes with governance challenges related to accountability, market regulation, and (long-term) planning. Increasing water prices will challenge the long term Ag 2050 vision.

APPENDIX C: WATER RELATED DISCUSSIONS/INSIGHTS FROM THE WORKSHOP

1. What is the maximum price for a water right that you/a farmer can pay for water that is provided with 95% surety and of high quality? Why?

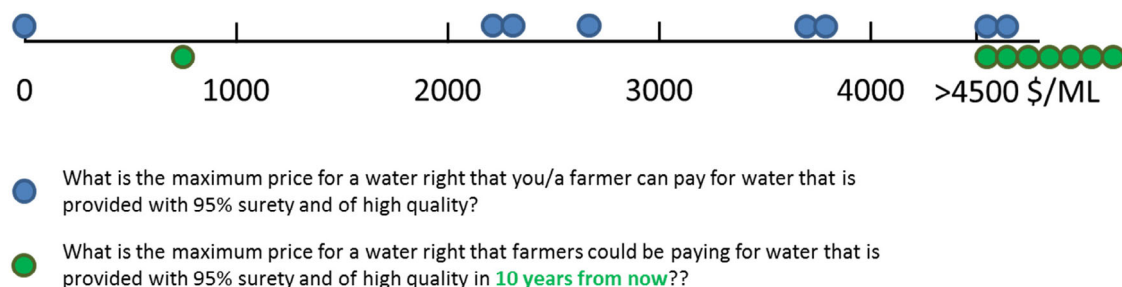


FIGURE C1 Difference between willingness to pay now (blue crossover points) and the expected price rise (green crossover points) [Color figure can be viewed at wileyonlinelibrary.com]

- Current water availability will put a ceiling or “cap” on the agricultural output of the valley.
- Water demand in Tasmania might be influenced by enterprises from the Murray Darling Basin that (need to) move to Tasmania. Various reasons and potential consequences were mentioned.
- Water prices and the willingness to pay for water have changed really quickly in the last 10 years. In the last 10 years, the market went from handing out allocations for free, to now selling water for \$5,000/ml as the highest outlier. The droughts of 2000 and 2008 are mentioned as years in which perceptions changed.
- Metering water uptake at farm level is imperative to improve water management at water-system level.
- Despite the increase in overall water use in the area, there are fewer enterprises irrigating.
- In the long term, a higher willingness to pay for water might provide enough demand to cover the cost of building another irrigation scheme.
- The government has an important role to facilitate a water market. A long term view of the preferred state of the resource is crucial.
- Some potential buyers cannot come up with the capital to invest in water rights. A deferred payment, in which a percentage of the upfront cost for water rights could be paid 5 years after the start of the operation, would allow growers the time to change enterprise. A deferred payment system was discussed as a promising option to increase the initial uptake.
- Investing in expensive water limits the transformation capacity to change current business, that is, to become more intensive or to chase a market opportunity that requires capital investments other than water.
- Water demand, and with that the potential to grow more high value crops, increases over the years due to experience.
- All participants agree that forward looking and exploring the future use of water before building an irrigation scheme is

essential. Participants called this exploration “future proofing” and “no-regret design decisions”.

- If people were encouraged to think more broadly about the (potential) value of water, they might buy more water when a new irrigation scheme is built. A learning process may increase initial water demand.
- A subsidy from the government to decrease the price of water might be perceived by the community as a transfer of wealth to the current land holders.
- The government investing in extra scheme capacity might become profitable when this water is sold at a later stage (when prices are higher). It is then an investment rather than a subsidy.
- Reuse water provides an additional source for enterprises that cannot afford high value water.

In the South East, various water sources are available. These sources vary in water quality, reliability, tradability, and costs. The next three questions focus on how and why characteristics of water change the willingness to pay for this water. Indicated crossover points are displayed in Figure C2.

- What is the maximum price that you or a farmer can pay for water that has 80% surety and is of high quality? (So no longer 95% but 80%).
 - If 80% means 1 year out of five you do not get water, it is not suitable for perennial crops. Does 80% mean you will not get any water, or you still get a certain amount but not your full allocation?
 - 80% can mean different things. For example, with reuse water, you do not know when water will be supplied (high uncertainty) but there is high certainty that you will get you full allocation during the growing season.
 - Reliability is context specific. The effect of low or high reliability on the willingness to pay for water is a personal matter in which participants had different opinions.
 - The opportunity to trade water is very important. In the SE3 scheme, tradability is location dependent. Farmers with perennials

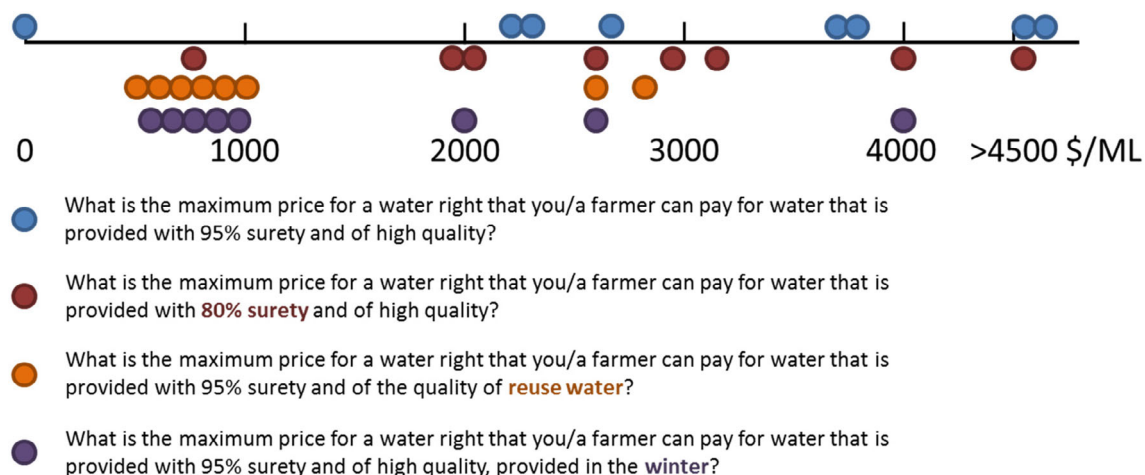


FIGURE C2 Crossover points, illustrating the influence of characteristics on willingness to pay [Color figure can be viewed at wileyonlinelibrary.com]

will buy water from farmers with annual crops when water becomes scarce. Whether or not there is a functioning water market heavily influences the willingness to pay for water of 80% reliability. Currently the trading market is not fully established.

- With lower reliabilities, having an on-farm buffer in the form of an on-farm dam becomes crucial. The cost of on farm storage is location dependent. The best location for a dam might also be the best land to grow crops.
 - Surety turned out to be the wrong word to use. Surety means you get 100% in 95% of the years and you do not get any in the other 5%. The practical meaning of 95% reliability is that you get at least 95% of the water in 100% of the years. Surety is not a word used in the contracts of TI.
 - What is the maximum price for a water right that you/a farmer can pay for water that is provided with 95% reliability and of the quality of reuse water?
 - It is suggested that water in farm dams in the South East is often of very low quality (salt)
 - What comes with quality of reuse is the regulation of reuse water. These regulations have large effects on how, when, where, and on what farmers can use reuse water. These constraints heavily influence the willingness to pay. An example is that farmers cannot have cattle on fields recently irrigated with reuse water.
 - With the current treatment systems, the regulations on reuse water are necessary.
 - Reuse water contains valuable nutrients, but most of the nutrients are lost during (on-farm) storage.
4. What is the maximum price for a water right that you/a farmer can pay for water that is provided with 95% reliability and of high quality, provided in the winter?
- The difference between water supplied in the winter, versus water supplied in summer is the cost of storage and losses due to leakage and evaporation. The cost of storing water is location dependent.
 - The value of winter water is correlated with the value of summer water. Some participants argued that the market price for winter water should be significantly less than water supplied in the summer but others argued that having a full dam at the beginning of spring is worth a lot.
 - With 95% reliability, and water supplied in the summer, you only need a small farm dam. Water supplied in the winter (all) needs to be stored. The cost of a large dam versus a small dam is again location specific.
 - Currently, the SE3 summer water is supplied from October to March. Recycled water is supplied all year, and there are increasing demands for water in the shoulder seasons (Sept and April/May). The demand for water in the shoulder season, related to a changing climate, future growing seasons and crop choice influence the value of water supplied in winter.